Bear Creek Watershed-Scale Stormwater Management Plan

Jeff Burkey
King County
Department of Natural Resources and Parks
October 13, 2016

King County

City of Redmond
WASHINGTON

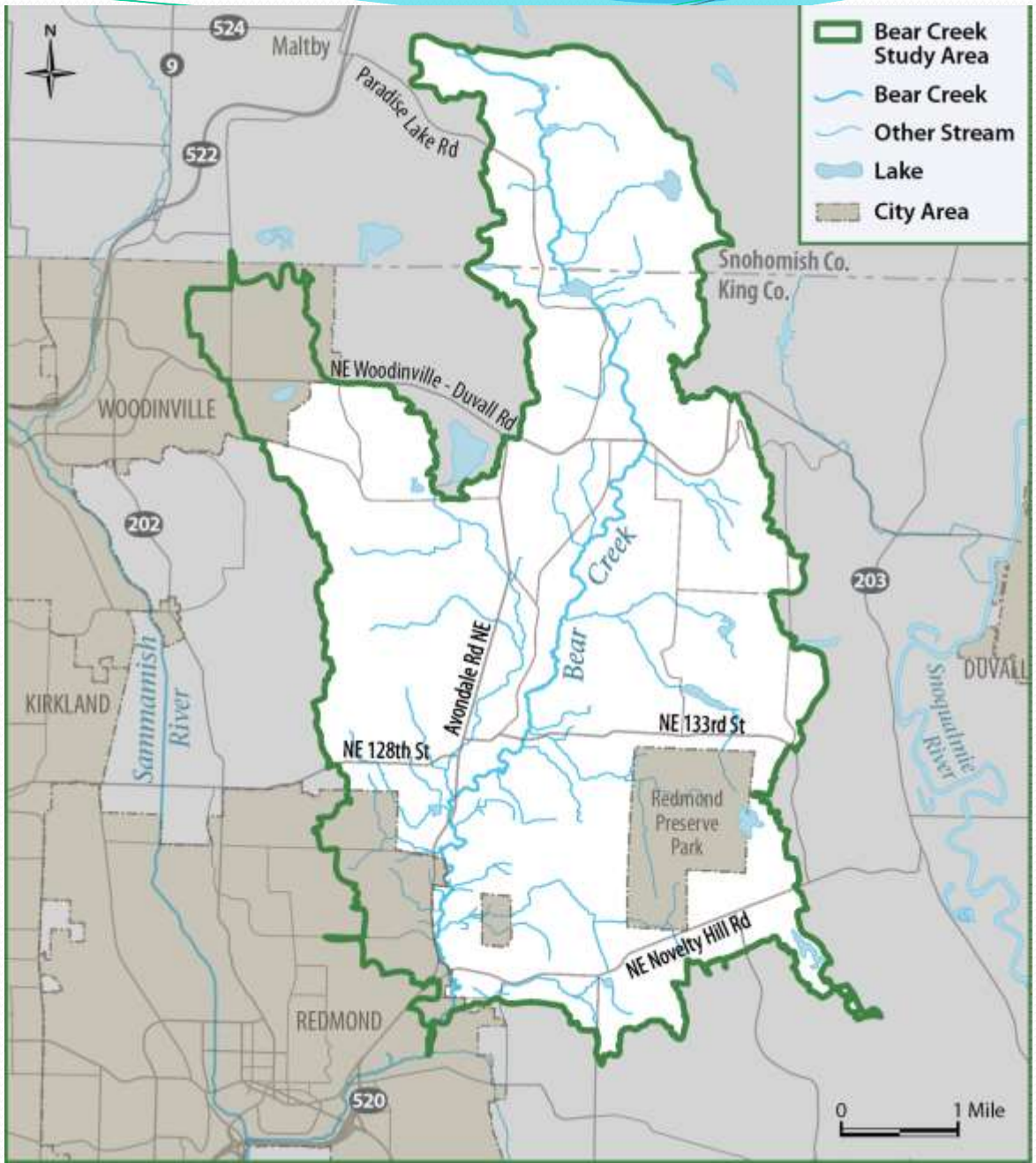
Snohomish County

The City of Woodinville

WSDOT

Bear Creek study area

- 26 square miles
- 240 miles of pipes/swales/ditches
- 66 miles of stream length
- 19% impervious

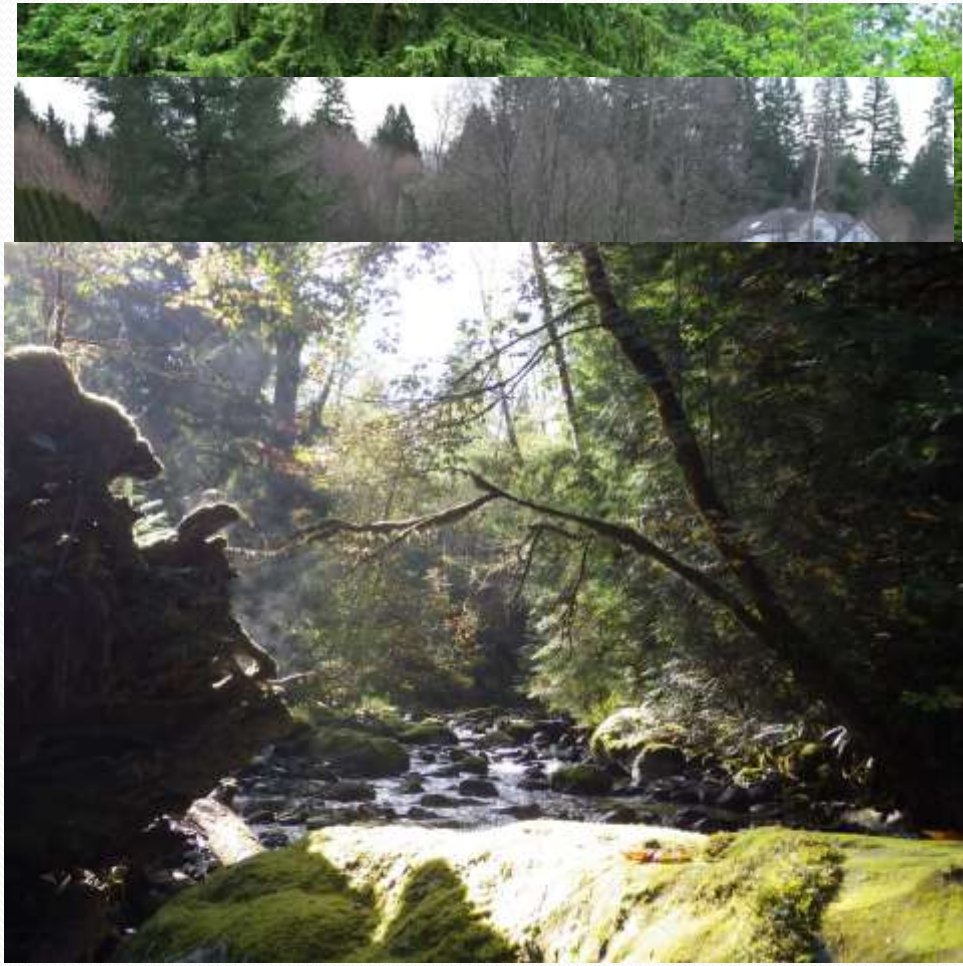


Why a Stormwater Plan for Bear Creek?

- Permit Requirement
- Health of Bear Creek is mixed
- Home to six species of salmon
- Population growth
- Update past efforts

Objectives for today's meeting

1. Sharing what we've learned
2. Share possible solutions
3. Get your input on ways to make the creek healthier



~~Four~~ Five * things needed for a healthy Bear Creek

1. Natural Stream Flow and Good Water Quality
2. Good Habitat
3. Track Progress
4. A Solutions Toolbox
5. Stewardship (e.g. YOU!)

Project schedule

- 2014-2016 studied the area
- 2017 assess solutions
- 2018 submit Watershed Plan

We are here!

Bear Creek Watershed Plan

Questions?

King County (Lead)
City of Redmond
Snohomish County
City of Woodinville
WA Dept. of Transportation

What we've learned about Bear Creek

Eric Ferguson
King County
Department of Natural Resources and Parks
October 13, 2016

Monitoring we've taken to date

- Collected stream flow, water quality and habitat data.
- Assessed how these things have changed over time.
- Used that data to create a model.

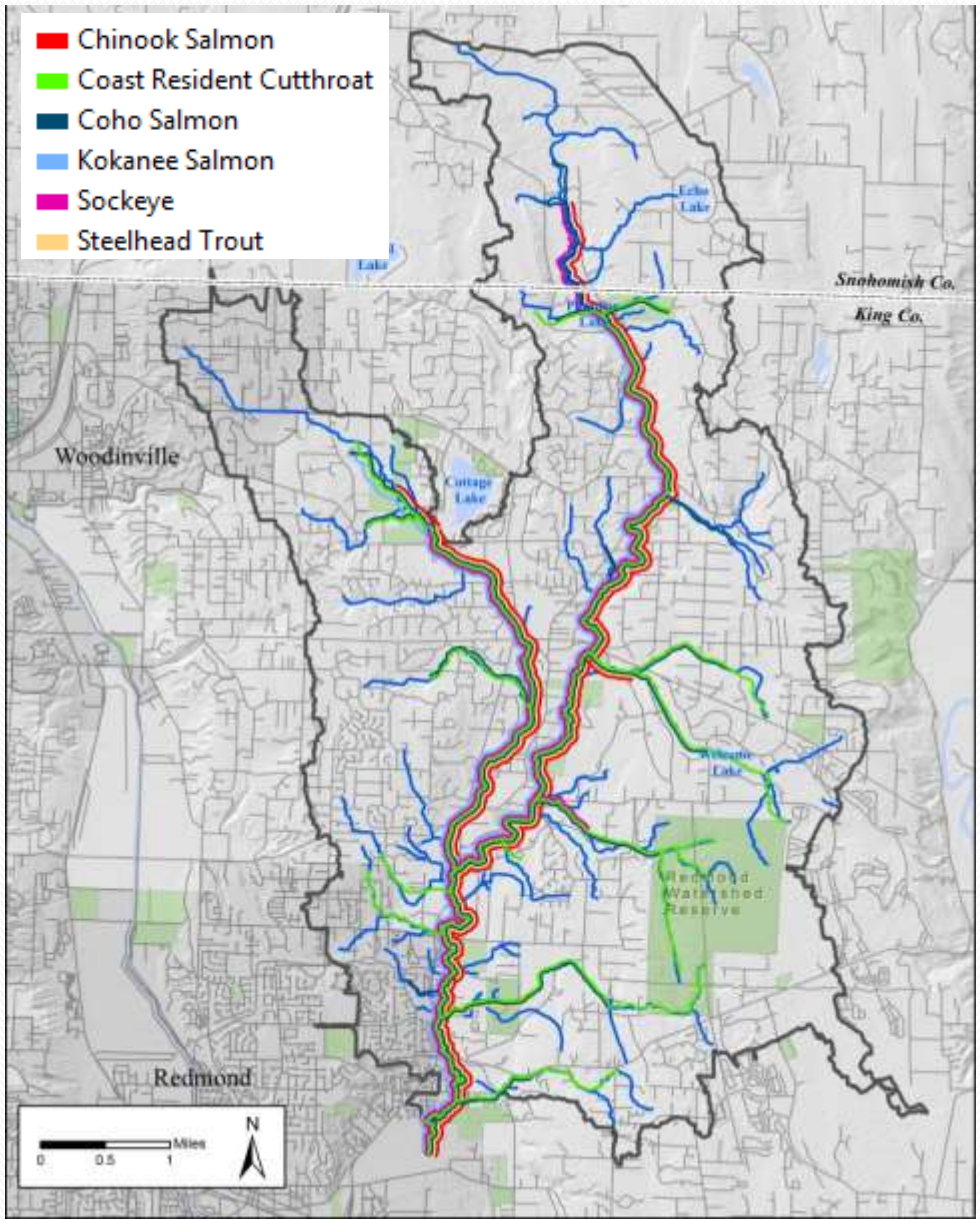
Summary of Findings

Improvements – Good

- 5 species of salmonids
- Good habitat complexity
  - (some areas)
- Stream flows
  - More natural flows
- Water Quality
  - Nutrients/TSS/bacteria levels
  - Metal – zinc
- Stream corridor – variability
  - ~50% tree lined
- Stormwater management
  - Regulate flows

Declines – Bad

- Low salmon numbers
- Poor habitat complexity
  - (some areas)
- Stream flows
  - Rapid rise and fall increasing
- Water Quality – above standards
  - Temperature/DO/bacteria
  - Metal – copper
- Stream corridor – variability
  - Needs more native areas
- Stormwater management
  - Aging/outdated structures

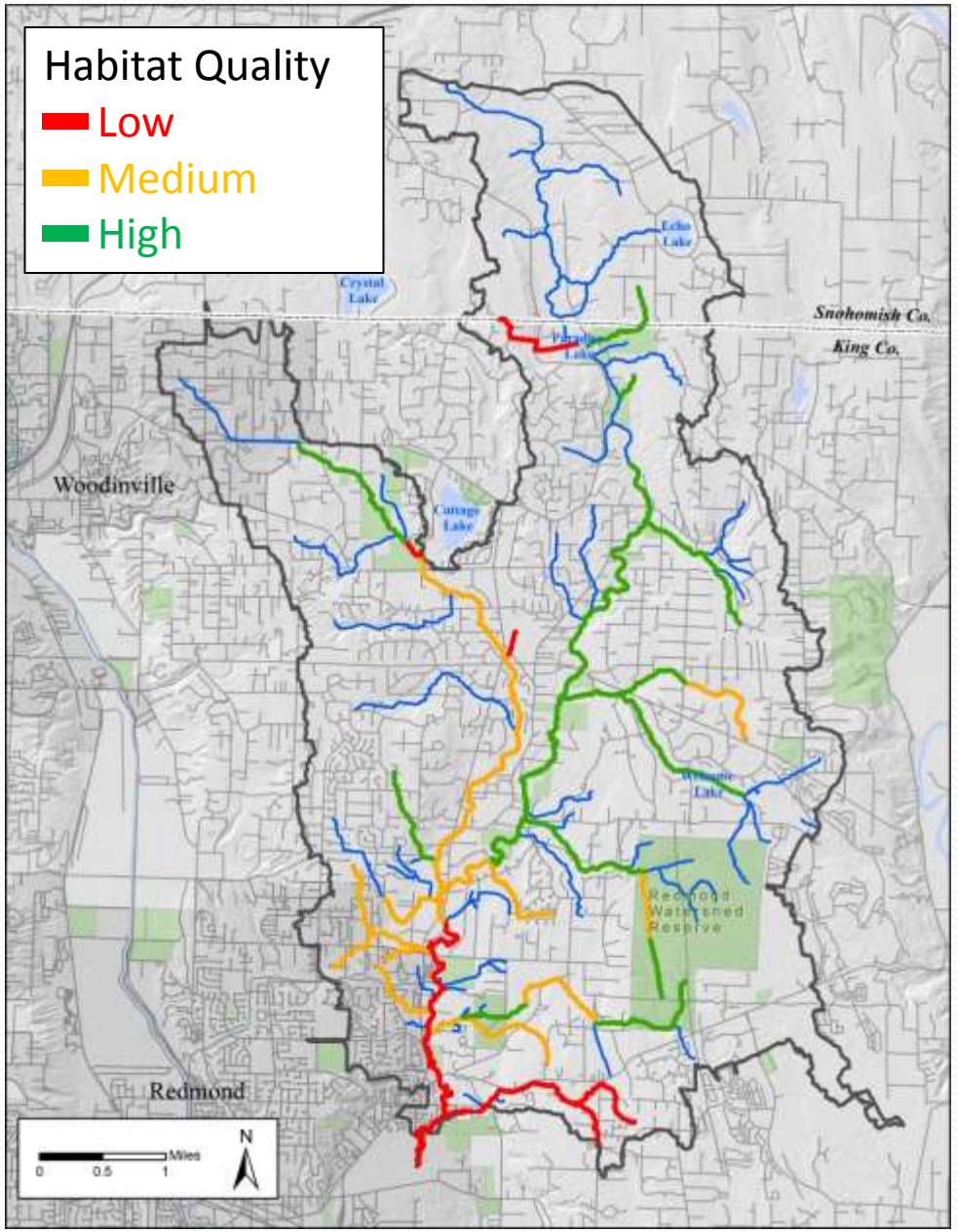


Summary of Findings – Good: Fish use

- Multiple salmonid species.
- Supports the majority of Chinook spawning in the greater Sammamish watershed.

Summary of Findings – Good: Instream Habitat

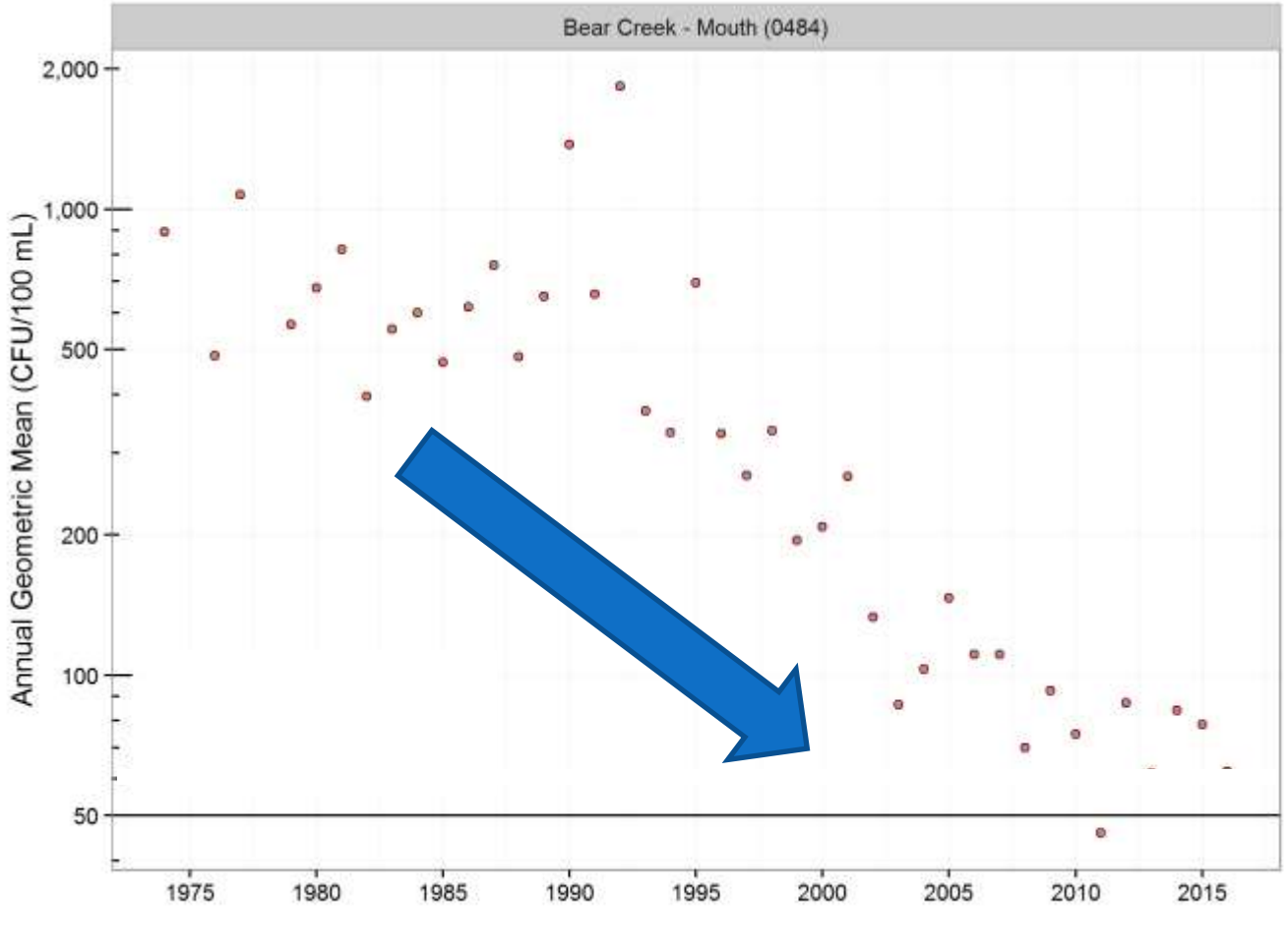
- The distribution and condition of habitats vary throughout the study area
- High Quality = good complexity



Summary of Findings – Bad: Stream flow

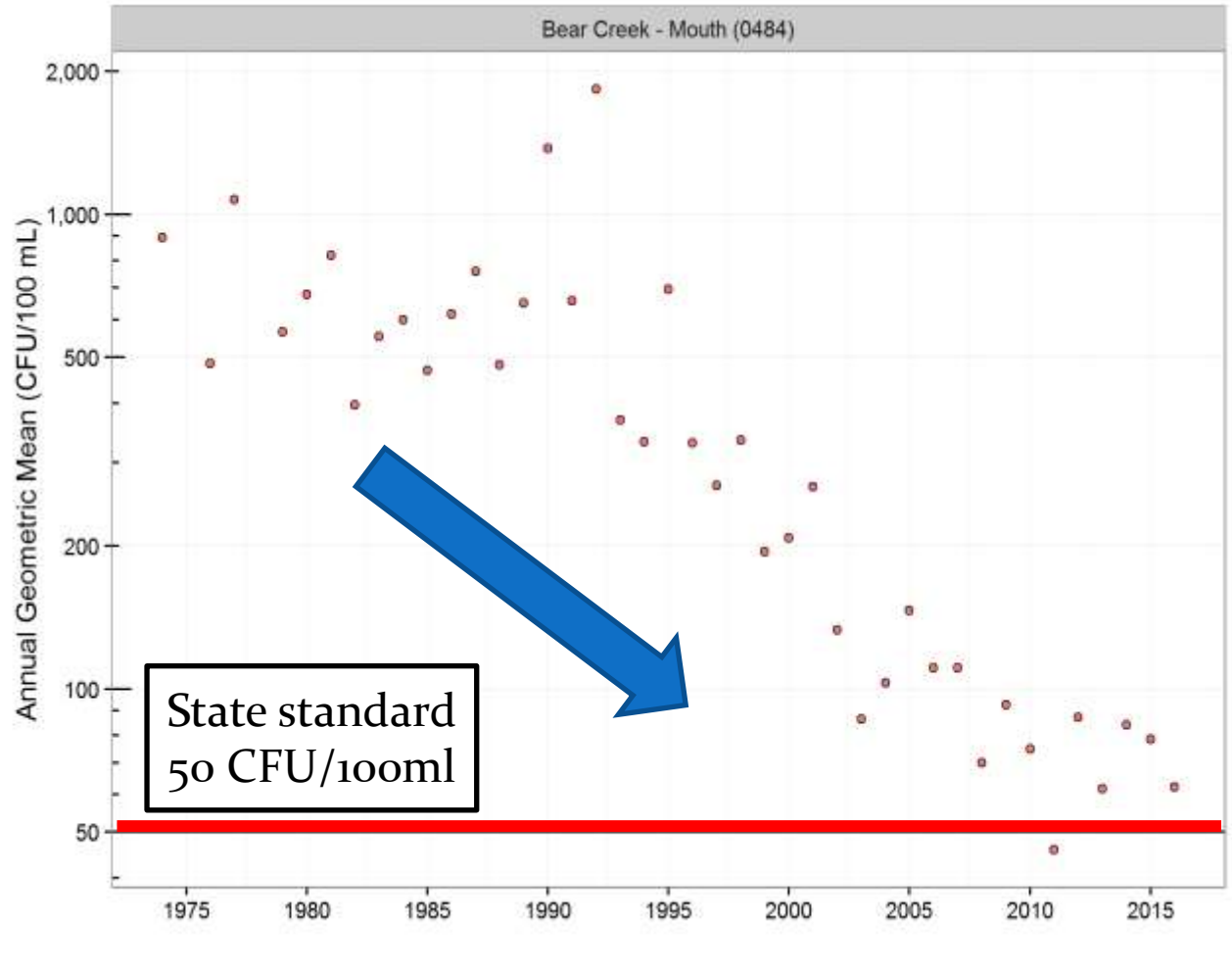
- Problems occur when stream flow rises and falls too quickly – this is increasing in Bear Creek.

Summary of Findings – Good: Water Quality



- Bacteria levels decreasing thru time
- Others
  - Nutrients
  - Total Suspended Solids
  - Zinc

Summary of Findings – Bad: Water Quality: not meeting standards



- Bacteria levels decreasing thru time but still above
- Summer temperatures above
  - 0.9° F per decade
- Summer dissolved oxygen levels not meeting standard
  - low levels
- Copper
  - Recent storm samples

Summary of Findings –

BAD

Stream Corridor

Non-native Blackberry

Summary of Findings – Good: Stormwater management

- Built to regulate flow
- Improve water quality

Summary of Findings

Improvements – Good **Declines – Bad**

And the Ugly

Caddis fly

Questions?

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City of Woodinville
WA Dept. of Transportation

Solutions "Tool Box" to Make Bear Creek Healthy

Andy Rheaume
City of Redmond
Department of Public Works, Natural Resources Division
October 13, 2016

Overview

- What tools do we have?
  - Control runoff
  - Cleanse runoff
  - Restore habitat
  - Stewardship
- Seek feedback on tools

Control runoff

- Detention ponds

Control Runoff

- Detention Vaults

Control Runoff

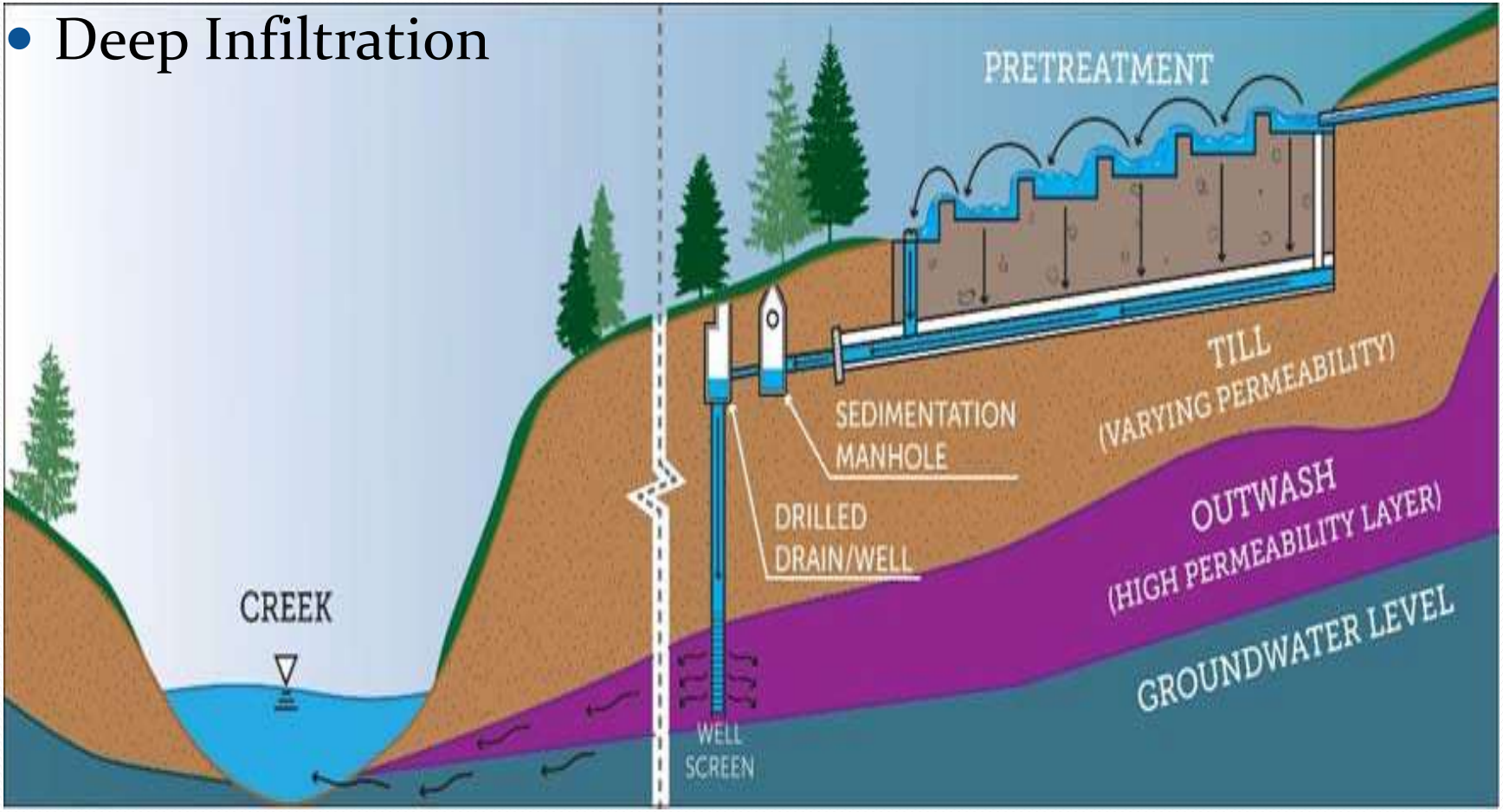
- Rain Gardens

Control Runoff

- Rain barrels
- Cisterns

Control Runoff

- Deep Infiltration



Control Runoff in the future

- Change zoning code
- Change development requirements
  - LID, more right-of-way
- Utilize development tools
  - Lot clustering
  - Transfer of development rights
- Buy land for conservation

Cleanse Runoff

- Local government programs
  - More street sweeping
  - Clean drainage pipes more often
  - Outreach campaigns

Cleanse Runoff

- Filters
- Rain gardens
- Ponds

Restore Habitat

- In-stream projects
- Planting trees and shrubs
- Connect natural areas

Stewardship

- Plant native vegetation/trees
- Rain garden or cistern at home
- Educate kids in schools
- Hobby farm/animal waste
- Reduce chemical use
- Septic system maintenance
- Non profits

Feedback On Solutions

- Did we miss anything?
- What do you like?
- What do you not like?